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VOL. 71, NO. 18 PAGES 273-288

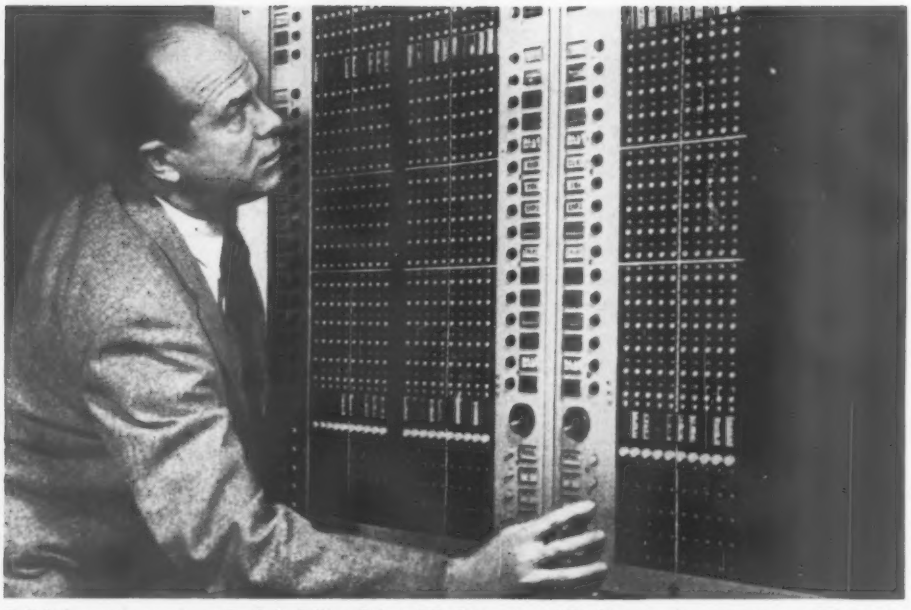
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Early Summer Visitor

See Page 286

A SCIENCE SERVICE PUBLICATION



Bell Laboratories engineer Cyril A. Collins, B.S. in EE., University of Washington, demonstrates new TV switching control panel for black and white or color. Complex switching connections are set up in advance; in a split second a master button speeds dozens of programs to their destinations all over the nation. Special constant-impedance technique permits interconnection of any number of broadband circuits without picture impairment.

Telephone science speeds TV enjoyment

Telephone science plays a crucial part in your TV entertainment. An interesting example—one of many—is the latest TV switching center developed at Bell Laboratories.

Switching centers control the transmission of programs which come to your local TV station over Bell System facilities. To be available exactly on cue, programs must be switched at high speed and with very great accuracy.

To create the new switching center Bell Laboratories engineers borrowed from the switching control art which handles your dial telephone calls. They developed a special control panel which puts complex switching patterns within the easy grasp of one man. By pushing buttons, he sets up—and double-checks—forthcoming network changes far ahead of time. On cue he presses a master button which sends the programs racing to their respective destinations around the nation.

To connect the broadband circuits, the Laboratories engineers developed a new video switch which operates on a constant-impedance principle. The new switch permits the interconnection of any number of circuits, without the slightest impairment of transmission quality.

Thus the technology which serves your telephone also works for your TV enjoyment.

BELL TELEPHONE LABORATORIES

World center of communications research and development

WEATHER

Cloud Seeding Debated

Scientists at the U. S. Weather Bureau report research results showing that the chances for rain from warm and supercooled clouds are greatest when the air is clean.

➤ WEATHERMEN are debating if indiscriminate cloud seeding on a large scale during the past five years could have caused the worst drought of recent times in the Midwest and Southwest.

Basis of the debate is a scientific report to the National Academy of Sciences meeting in Washington by Dr. Ross Gunn of the U. S. Weather Bureau. He finds that the cleaner air is, the better are the chances of rain from warm and supercooled clouds.

For many years cloud seeders have claimed they can increase rainfall by throwing into the air certain chemicals around which raindrops form. The idea is to add to the number of tiny particles normally present, thus causing more rain.

Now it seems such operations might actually have been inhibiting rainfall, and might have caused recent severe droughts.

Dr. F. W. Reichelderfer, Weather Bureau chief, urged that hit-or-miss cloud seeding be discontinued immediately until new studies are completed.

When questioned concerning the implications of Dr. Gunn's report, he said, "more research of a thorough and fundamental nature on cloud physics is urgently required."

Dr. Reichelderfer said he did not believe cloud seeding caused the drought, but noted that Dr. Gunn's report suggested contaminating particles in the atmosphere may decrease rainfall.

Dr. Gunn's studies, made in a 60-foot expansion sphere in Texas, show the size of newly formed cloud droplets depend critically on the air's cleanliness, clean air giving more rain. Droplets formed in dirty air are too small to grow, but if the air is sufficiently clean, droplets large enough to fall as rain are "immediately formed by condensation."

This contradicts the idea of adding particles to increase rainfall as cloud seeders have done.

Dr. Gunn concludes that pollution is swept out of the atmosphere during periods of general cloudiness and precipitation, thus reducing the number of particles present. Droplets formed thereafter can then grow still larger, increasing the chances of appreciable precipitation.

"The rain-producing cycle is, therefore," Dr. Gunn reported to the Academy, "provided with a feedback or regenerative mechanism which usually proceeds in a given mass of air until the air is appreciably dessicated (dried)."

The particles around which raindrops and water vapor form usually accumulate in fair weather. The presence of these particles may delay rainfall until the clouds become sufficiently unstable so that the overlying clean layers are lifted or cooled. Then the precipitation cycle may be re-established, Dr. Gunn concluded.

Byron B. Phillips, also of the Weather Bureau, cooperated in the research.

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CHEMISTRY

Credit Pliny With First Chemical Test

➤ A ROMAN SCHOLAR, Pliny, has been credited with developing the oldest recorded test for a chemical element more than 2,000 years ago. Dr. John H. Yoe of the University of Virginia credited his early fellow chemist with devising a test for iron in sugar.

Pliny's test, Dr. Yoe pointed out at the American Chemical Society meeting in Miami, is the first known instance of the use of colorimetric analysis.

As a "reagent," or chemical detective, Pliny used a piece of papyrus soaked in a watery extract of gallnuts. When dipped in vinegar, Dr. Yoe explained, the papyrus turned dark blue or black if iron was present.

"This seems to be the first chemical reagent on record and, although now more than 20 centuries old, it still may be used for the detection of iron in vinegar and other liquids, though filter papers, rags, or wood shavings have replaced the ancient papyrus," Dr. Yoe said.

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PALEONTOLOGY

Rare Fossil Egg Acquired By American Museum

➤ AN EGG laid about 120 million years ago by a sauropod dinosaur, thought to be one of the largest animals ever to walk on land, has been acquired by the American Museum of Natural History, New York. It is the only such egg in the Western Hemisphere.

The rare fossil egg, described by Museum curator Dr. Edwin H. Colbert as "about twice the size of an ostrich egg," will be on exhibit at the Museum during the summer.

It has been attributed to the dinosaur *Hypselosaurus priscus*.

The inner parts of the egg are perfectly preserved and part of the shell has been retained.

One of several discovered at Aix, France, in 1869, the egg was given to this Museum by the Museum of Natural History, Aix, in exchange for an egg of an early horned dinosaur called *Protoceratops*. The horned dinosaur egg was one of a group found by an American expedition in Outer Mongolia during the 1920s'.

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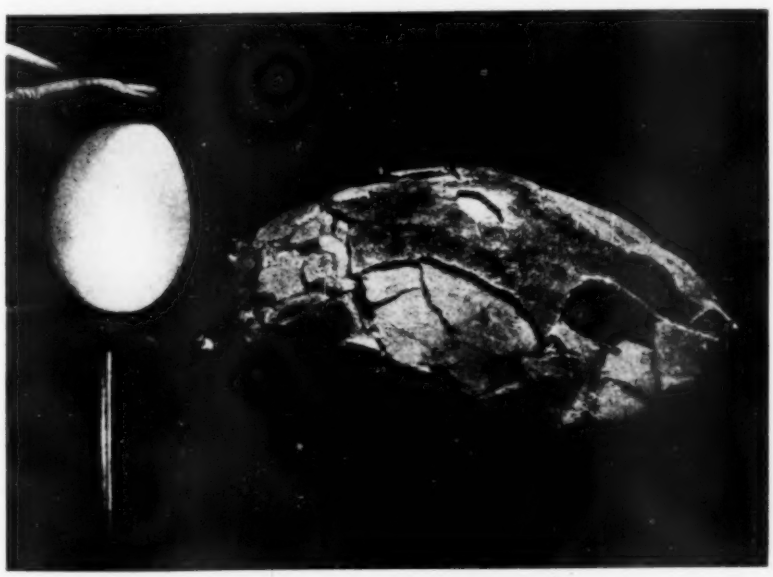

***FOSSIL EGG**—The large size of the rare dinosaur egg acquired by the American Museum of Natural History is apparent when it is compared with an ordinary hen's egg. The fossil egg is slightly crushed and flattened.*

GENERAL SCIENCE

Fair Winners' Dreamland

➤ LOS ANGELES will become the young scientists' capital of the United States during the National Science Fair, May 9-11.

About 231 girls and boys, representing 122 regional science fairs, will come into Los Angeles to exhibit projects.

The three days of the Eighth National Science Fair, conducted by SCIENCE SERVICE, will offer unique opportunities for the young scientists to meet other teen-agers who are interested and competent in science, to talk with some top scientists who are serving as judges of the projects, and to expand personal plans and interests.

It is no wonder that so many science-minded high school students worked hard for the reward of an all-expense trip to the Eighth National Science Fair. The potential scientists fortunate enough to have won the trip will find that both the Fair and the Los Angeles area offer them unique opportunities and inspiration.

Trips to the California Institute of Technology, the University of California at Los Angeles, or the University of Southern California will be many high school students' introduction to a college campus and their first glimpse of such dreamed-of wonders as a synchrotron, a hypersonic wind tunnel, a "cobalt bomb" for cancer treatment, and full scale college laboratories.

The La Brea Tar Pits, where thousands of specimens of later Pleistocene animals have been collected, is the only place like it in the world.

Another "only" experience will be the Walt Disney Studios and a film especially prepared for the National Science Fair, which will give an inside view of the secrets of photographing wild life and true life.

Then there is the Arboretum, where the students can see southern California desert and valley plants and plant experiments; the world's largest oceanarium, the Marineland of the Pacific, with thousands of deep sea creatures in natural surroundings; the famous Griffith Observatory and Planetarium; the research operations in jets, rockets, and missiles of the Los Angeles area aviation industries; precision electronic instruments, spectrophotometers, spectrometers, and other analytical instruments at Beckman Instruments, Inc.; and experiments in petroleum, gas, and chemical processing at the Fluor Corporation, Ltd.

Dr. Wendell M. Stanley, Nobel laureate and the founder of modern virus research, will be the principal speaker at the medical awards banquet, arranged by the American Medical Association, on May 10.

Dr. Stanley, who is professor of biochemistry and director of the Virus Laboratory at the University of California, Berkeley, will tell his audience of young Science Fair finalists, educators, and other guests, about "Living Molecules."

Dr. Glenn T. Seaborg, distinguished nuclear chemist and Nobel Prize winner, will be the main speaker at the awards banquet of the Science Fair.

Chemistry and his experiences in discovering chemical elements will be the subject of Dr. Seaborg's speech. He has been a leader not only in research but in the science youth program.

Dr. Howard L. Bevis, chairman of the President's National Committee for the Development of Scientists and Engineers, will also speak at the awards banquet on May 11.

Dr. Bevis says, however, that he is attending the Fair "more to look than to tell." He believes that the aims and activities of the National Science Fair dovetail very well with the purpose of the Committee.

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MEDICINE

Bloodletting Comes Back

➤ BLOODLETTING, the medieval medical practice of draining off various amounts of the body's vital fluid, is coming back in style, but for newer and more scientific reasons.

Plasmapheresis, a type of bloodletting where the whole blood is removed, divorced of its plasma content, and then immediately put back into the donor, has dramatically opened new opportunities for treatment of disease as well as the stockpiling of valuable plasma for emergencies.

The technique was reported by Drs. Joseph Stokes Jr. and Joseph Smolens, School of Medicine, University of Pennsylvania, to the American Philosophical Society meeting in Philadelphia.

Three main purposes of bloodletting are to relieve the body of ingested poisons, to extract immune serums, or to stockpile ordinary human plasma, Dr. Stokes told SCIENCE SERVICE.

A pint of blood is removed each time and quickly put into an especially designed centrifuge that separates the red blood cells from the plasma. The plasma is taken off for other uses and the red cells are back in the body within 21 minutes. The same blood donor can be used as often as once a week since the body's plasma level appears to return to normal within 24 hours after the bloodletting, Dr. Stokes said.

In cases of poisonings, the blood separation technique can quickly remove the toxic substances from the blood and do the job much easier than an artificial kidney does.

Plasma taken from donors who are immune to diphtheria, mumps, whooping cough and tetanus is especially valuable since it can be used for the control of these diseases in other persons. Many of the serums currently used for this have been developed in horses and because of this they cause unwanted reactions in almost half of the people who receive them, Dr. Stokes explained.

An added advantage of this type of plasma collection is that it makes available plasmas from one individual. The currently used blood donating system, Dr. Stokes reported, supplies only mixed plasmas pooled from many donors.

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MEDICINE

New Cancer Theory

➤ EVIDENCE that cancer is a "deficiency disease" that could be controlled by an as yet unknown substance in body fluids is reported by Drs. L. A. Erf and B. J. Miller, Jefferson Medical College and Hospital, Philadelphia, in *GP* (April), published by the American Academy of General Practice.

There is hope that eventually cancer might be treated in much the same way pernicious anemia is controlled by doses of vitamin B-12.

Experimental studies and those on human patients support the theory that some tumors are due to a lack of substances body cells need in order to mature. Without them, the cells divide continuously and never grow up into functional, adult cells, the scientists report.

This theory of "maturation arrest" explains why some agents such as X-rays and toxic drugs slow down cancer growth. It also explains why antibodies against cancer cells do not exist, they say.

According to the maturation theory, X-rays help cancer because they destroy some of the cancer cells and release from them the specific maturing substance, adding to the amount that is needed by the patient for self-defense against the remainder of the cancer.

The maturing substances needed by the cells could include enzymes, catalysts, hormones or vitamins, many of which are carried by the blood stream. The deficiency can occur either within the cell itself or as a generalized condition existing around many cells.

The scientists observe that pernicious anemia was known as "cancer of the red blood cells" before 1925.

This disease is characterized by an overwhelming production of immature red cells which infiltrate many organs of the body. The cells never mature, it was discovered, because they lack vitamin B-12, the substance necessary for them to develop into healthy red cells.

Guinea pig blood serum can cause complete remission of some types of transplanted cancer when injected into mice. This indicates, say Drs. Erf and Miller, that the maturing substance needed for human cancers may possibly be found in other biological categories such as plants, bacteria or fungi.

For the past 50 years cancer research has been directed to "killing" cancer cells while little effort has been made to maturate them. In rare cases cancer antibodies have been found.

However, these are not effective in controlling the cancer, since there can be no antibodies against something that is absent, the scientists explain.

When antibodies develop against transplantable cancer, the antibodies are against the cancer cell protein, not against the cause of the cancer.

The scientists conclude that analyzing fresh human blood and body fluids in order to isolate and identify the maturating substances is one of the most important medical research projects of the future.

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AERONAUTICS

Glass Skyport for Britain

➤ A PLAN to erect a 500-foot high skyport, supported by three glass-clad towers, in central London has been suggested by the Glass Age Development Committee, formed two years ago to propose architectural means of answering the planning requirements of the year 2000.

Skyport One, as the scheme is called, was evolved from a close study of the requirements of scheduled short-haul air services. New aircraft will be able to make vertical take-offs and landings like a helicopter and their flight will be similar to that of ordinary jet or turbine-prop airliners.

It is assumed the aircraft using the Skyport, one of a number of air stops in the London area, will be operating chiefly on inter-city services within Britain and to France and nearer countries in northwest Europe.

A clover-leaf landing platform, with three sections each 120 feet in diameter, will provide space for handling 24 aircraft an hour, allowing each aircraft seven-and-one-half minutes to land, unload, reload and take off.

The three shafts supporting the flying platform consist of finned structural drums encased in outer cylinders of glass behind which the high speed elevators, serving the superstructure at the rate of one every 45 seconds, will be visible.

The shafts straddle a triple-wing building with a subsidiary landing deck on its roof for the use of private aircraft and non-scheduled flights.

Associated with Skyport One are a basement bus station and a subway station, to which depth elevator shafts will be sunk.

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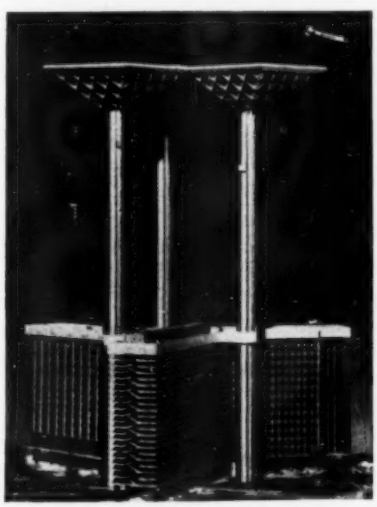

GLASS SKYPORT — The photograph shows a day view of a model of Skyport I with the early morning sunlight on the glass supporting columns. The triple-wing building provides space for offices, a hotel for transients and parking areas.

TECHNOLOGY

Glass Fibers Made to Withstand High Heat

➤ GLASS FIBERS that can withstand high temperatures of 5,000 degrees Fahrenheit or better are being tailor-made for intended use in jet aircraft and guided missiles.

Glass fiber that can stand up to 2,350 degrees Fahrenheit is already being produced in a pilot plant at the rate of 200 pounds per day, Dr. Alexander Silverman of the department of chemistry, University of Pittsburgh, told the National Academy of Sciences at its annual meeting in Washington.

These fibers are longer, softer and more durable than any others like them, he said. Both higher-melting fibers and special heating systems for producing them are now being studied.

The high-melting glass fibers are obtained directly from high-melting oxides, minerals and their mixtures. This direct change is used, Dr. Silverman explained, "since no classical glass-melting furnaces were capable of attaining the necessary temperatures."

In making the high-melting fibers, the raw materials were mixed with suitable binders, wetted, and converted to a plastic mass that was extruded downward, in continuous rods or tubes, by a screw feed. These were then dried and baked by convection currents and passed through high-temperature burners.

The lower end of the baked extruded material was melted instantly and homogeneously to glass, which was either blown by compressed air or steam into bulk fibers, or drawn into monofilaments.

The capacity of the pilot plant producing bulk fiber that can withstand heats of 2,350 degrees Fahrenheit can be increased to one ton a day, Dr. Silverman said.

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MEDICINE

Tranquilizer Makes Addicts of Animals

➤ MEPROBATE, the tranquilizing drug known popularly as either Equanil or Miltown, creates the same type of "withdrawal symptoms" as dope when given in large doses to mice, Drs. Ewart A. Swinyard, Lincoln Chin and Edward Fingl, College of Pharmacy and College of Medicine, University of Utah, Salt Lake City, report in the journal *Science* (April 19).

After continued use of the drug, mice became dependent on increasing amounts of it to get the same effect as on original smaller doses. When the drug was abruptly withdrawn from them, the mice became "hyperexcitable" within four to eight hours, a condition in which human narcotic addicts show nervousness and tremors which may lead to convulsions.

Whether or not psychosis can be brought on by the drug's reactions has yet to be determined, but the findings support the suggestion that the tranquilizer should be added to the list of drugs that cause withdrawal symptoms.

Admittedly, the scientists report, only high dose levels of the drug were used, but this is justified on the basis that human addicts take large doses also, and these large quantities are usually necessary to show dependence on barbiturate drugs in man.

They emphasize, however, that before making any final judgment on the "addiction liability" of the drug, the amount of it needed to obtain beneficial results must be compared with that which brings on the withdrawal symptoms.

The studies imply, the researchers conclude, that the same care should be taken with meprobamate that is taken with barbiturates, and all members of the new classes of tranquilizing drugs should be "held suspect" until definitely proved otherwise.

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PSYCHOLOGY

Detail Distinction Lack Delays Early Education

➤ IF a simple system were developed whereby young children could be taught to distinguish one object from another, formal education could begin at an earlier age than at present.

Dr. Wendell E. Jeffrey, psychologist at the University of California at Los Angeles, has just completed experiments which support this idea.

"This inability to distinguish major details is a source of much early childhood frustration," he points out. "And present-day educational doctrine is based upon the idea that a child's schooling must be delayed until certain stages of discrimination development are reached.

In his experiments, two child-like representations of human figures, different only in that one pointed left and the other right, were used. Children were asked to identify the one pointing left as Jill and the other as Jack. Musical nursery jingles were played over earphones, and if the child made the incorrect response, the music stopped. Many four-year-olds could not learn to identify the figures correctly.

Then by gestures the children were told to punch a button on the left for the figure pointing left and a button on the right for the other figure. The children learned this left-right discrimination readily and were then able to make Jack and Jill identifications easily.

"Once this relatively simple discrimination is learned, more complex ones such as distinguishing "d" and "b," a formidable obstacle to many seven-year-olds, can be learned," Dr. Jeffrey says.

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PUBLIC HEALTH

Water Is Poor Cleanser For Fallout "Dirt"

➤ RUNNING fresh tap water over skin that has been exposed to radioactive fallout is definitely not the best way to remove the dangerous material, Dr. William J. Friedman, U. S. Naval Radiological Defense Laboratory, San Francisco, Calif., reported to the American Industrial Hygience Association meeting in St. Louis.

Various methods of cleansing skin contaminated with synthetic radioactive fallout were tested and the least effective of these was running water. Of the watery methods, a detergent and water combination proved to be the best, while a mechanics hand cream was the best of the waterless methods tried, Dr. Friedman reported.

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PUBLIC HEALTH

Advises Booster Polio Shot

➤ CHILDREN should now get a fourth "booster" shot of polio vaccine if they received the recommended series of three shots over a year ago, reports Dr. Thomas Francis Jr., chairman of the epidemiology department at the University of Michigan, Ann Arbor.

Dr. Francis, who evaluated the 1954 field trials of the vaccine, advises the booster as a safety measure "until we have a much firmer picture of the lasting potency of the vaccine."

He suggests children and teenagers get the booster to ensure the vaccine has an opportunity to exert its full effect.

Boosters need not become an annual affair, however, since this is only the third year the vaccine has been used on a national scale. Boosters will probably be needed less frequently as improvements in the potency and consistency of the vaccine are made, he said.

Dr. Francis discounts giving the vaccine credit for the low incidence of polio in 1956, but he adds "there is clear evidence that the severity of polio is less in vaccinated cases."

The decline in polio last year may have been the result of natural variations in the incidence of the disease.

The vaccine should be credited, though, with the sharp drop in the number of paralytic cases in the highly susceptible five-to-nine-year-old age group, he added.

Okays Delayed Polio Shot

➤ SEVERAL months delay in getting the second of the three polio vaccine inoculations causes no "immunological disadvantage" in school children, Dr. Gordon C. Brown, School of Public Health, University of Michigan, Ann Arbor, reported to the Federation of American Societies for Experimental Biology meeting in Chicago.

Irregularities in administering the vaccine have raised concern over its effectiveness when the three inoculations are not given at the recommended times. The most frequently encountered delay is between the first and second inoculations, Dr. Brown said.

The recommended schedule is to have the second inoculation four to six weeks after the first, and then the third about seven months after the second.

A study was made of school children in the first three grades in Ann Arbor, Mich., who received their first dose of vaccine in April, 1955, but did not receive their second until the following September.

Although 13% of the children had no demonstrable antibody to any of the three types of polio virus studied before the second shot, all had at least some afterwards.

After the second shot, the percentage of children with antibodies to all three types of the polio virus increased from 33% to 85%, results which "compare favorably" with those obtained in children receiving their first two doses at an interval of one month, Dr. Brown concluded.

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CHEMISTRY

Make New Group Of Semiconductors

➤ A NEW GROUP of semiconducting compounds has been made in the Research Laboratories of the General Electric Co., Ltd., Wembley, Middlesex, England, Dr. C. H. L. Goodman reports.

The compounds have the same structure as chalcopyrite, which is a sulfide of copper and iron in complex crystals. The new compounds are combinations of zinc or cadmium with silicon, germanium or tin, and arsenic or phosphorus . Dr. Goodman's report appears in *Nature* (April 20).

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PUBLIC HEALTH

Radiation Danger Grows

➤ MAN MAY be in more danger from atomic radiation than was thought a year ago, Dr. H. Bentley Glass of Johns Hopkins University, Baltimore, suggested to members of the National Academy of Sciences meeting in Washington.

Last year the genetics committee of the National Academy of Sciences set the safe radiation exposure to the reproductive organs as 10 roentgens over a 30-year period, he said. A roentgen is an international measure of radiation.

This was set on the assumption the 10 roentgen figure was much lower than the so-called doubling dose, but within the past year there have been indications the doubling dose may be down as low as three roentgens instead of up around 30 or 40, he said.

The doubling dose is that amount of radiation which will cause twice as many harmful genetic changes in man as occur spontaneously. At the present time, spontaneous mutations in man's heredity occur in an estimated two percent of all births, Dr. Glass explained.

Much of the increased exposure is due to enlarged estimates of medical and dental background radiation. Further studies are needed to make the increased estimates more accurate, he said, but researchers in Sweden also report about the same amount of background dose from medical radiation.

Last year's estimates on the amount of fallout radiation are still good and only amount to one-tenth to two-tenths of a roentgen over a 30-year period. This is about the same as that from a watch with a radium-treated dial.

Other members of the symposium on the genetic effects of radiation debated the thorny problem of whether or not rats are men, as far as radiation experimentation goes.

The life span of rats whose parents were irradiated with neutrons, which have possibly twice the effect of X-rays or gamma rays, was shorter than that of their non-irradiated brothers, Dr. W. L. Russell, Oak Ridge National Observatory, Oak Ridge, Tenn., reported.

Six-tenths of a day was taken off their life span with every roentgen of radiation exposure, and if this relationship is extended to humans, it would amount to shortening man's life span by 20 days per roentgen, he said.

But man is not an overgrown experimental fly or an overgrown mouse, Dr. Th. Dobzhansky of Columbia University, New York, told the geneticists.

We should not ignore the obvious similarities between species but, at the same time, the full answer to the problems of radiation hazard will be found only by studies which include its effects on mankind, Dr. Dobzhansky emphasized.

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PSYCHOLOGY

Men, the "Weaker Sex," Should Cry More to Live

➤ MEN, the "weaker sex," may have to start crying if they want to live longer, Dr. James O. Bond of the Florida State Board of Health told chemists at the American Chemical Society meeting in Miami.

Pointing to the fact that since the turn of this century women have been outliving men, Dr. Bond said, "life insurance statisticians, public health physicians, widows and magazine writers have, over the past several years, become successively aware of the fact that men are less durable, and perhaps more fragile, than women in our modern society."

Heart disease, accidents, suicide and tuberculosis are the big killers of men, Dr. Bond reported, but added that in all the 64 leading causes of death, male rates are higher than female with only nine exceptions.

Pointing his finger directly at undue stress, Dr. Bond said, "Men perhaps need to learn more from women either how to avoid emotional tension, or deal with it in less damaging ways than development of coronary artery disease."

One of the ways, he suggested, is for men to cry more or find a substitute for tears.

No single explanation for why man suffers more than woman will do. What is needed, Dr. Bond said, is further research.

"Fundamental to this research," Dr. Bond reported, "is an awareness by men that their badge of masculinity, their musculature, is no longer an advantage in the competition for survival in today's world. Indeed, it may even be a handicap due to the psychological role it forces men to play in a world that no longer accommodates that role."

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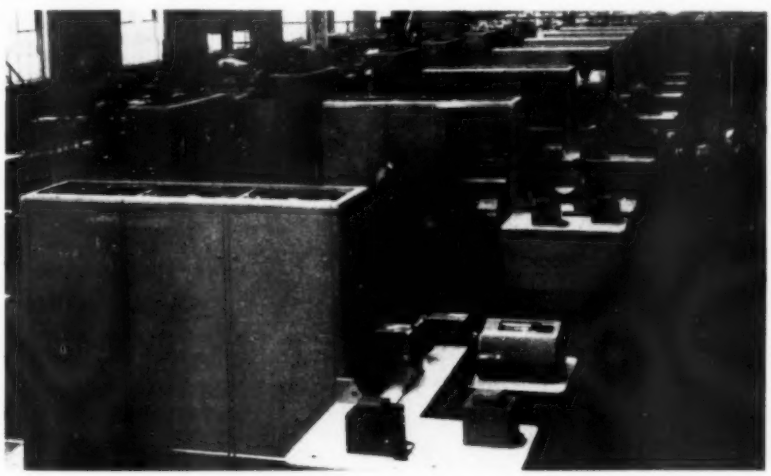

ENGLISH COMPUTERS—Foreign computers, like these English electronic digital computers, are competing with American machines in the international market. The photograph shows computers coming off the assembly line in a Ferranti plant at West Gorton, Manchester.

PUBLIC HEALTH

Study Effects of Climate On Multiple Sclerosis

➤ THE EFFECTS of climate, geographical area and other allied environmental factors on multiple sclerosis, medicine's mystery disease, will be studied by three large research organizations, the Veterans Administration reported.

About 100,000 Americans are now suffering from this disease which destroys the nerves and brings on increasing weakness and inability to coordinate body movements. There is no known cure or effective treatment for it.

The more than 2,000 members of the armed forces and veterans who have developed the disease during and since World War II will be the object of studies by the VA, the National Research Council, Washington, and the National Institute of Neurological Disease and Blindness, National Institutes of Health, Bethesda, Md.

The main reason for the study is to learn in what latitudes, climates and geographic areas these victims have lived.

The disease is known to be more prevalent in the northern United States and Canada than in the south. The scientists hope to determine whether the veterans moving to warmer climates have benefited.

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ASTRONOMY

Supernova May Be Cause Of Radioactive Elements

➤ ALL the radioactive elements in the solar system could have come from a single explosion of a supernova, a star that suddenly blazes forth to 100,000,000 times the sun's brilliance.

This event could have occurred 6,700,000,000 years ago, four scientists reported to the National Academy of Sciences meeting in Washington. Their calculations are based on the present ratios of two forms of uranium, U-235 and U-238, and the relative rates at which the ancestors of these elements decayed.

They assume a supernova explosion produced an intense concentration of neutrons, which are then available for synthesizing the elements. The proportions of various elements built up by this method of calculating agree reasonably well with those found from studies of meteorites.

The scientists reporting the study are Drs. William A. Fowler, F. Hoyle, G. R. Burbidge and E. M. Burbidge of California Institute of Technology.

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METEOROLOGY

Air Safety Endangered By Bureau Funds Cut

➤ CUTS in appropriations for the Weather Bureau endanger aircraft safety and dash hopes for revolutionary developments in hurricane and tornado forecasting.

The House of Representatives slashed nearly $2,000,000 from the funds requested to run the Weather Bureau for the fiscal year starting next July 1. Half of this amount was slated to provide new weather services for jet aircraft operations and for increased safety of all aircraft in flight.

However, the House voted no money at all for this vitally needed service. Also eliminated was $400,000 for rental of high-speed electronic computers to develop better methods of forecasting weather numerically. By denying funds for the new machines, Weather Bureau research plans must be deferred to later years, thus pushing even farther into the future the time when research results would be useful on a daily basis by local weather forecasters.

Tests during the past two years have shown enough promise to indicate that faster and more versatile electronic computers will bring much improved weather forecasts within a few years.

The denial of money for new weather services hits four proposed programs:

1. An improved system of inflight weather safety service to alert private, commercial and military aircraft concerning sudden weather changes;

2. Additional forecasting services to international flights departing from major inland airports;

3. An increase in the number of full and part time weather observation stations and pilot briefing offices; and,

4. Provision of special services for commercial jet aircraft, which require unique wind and temperature forecasts, not now made, for altitudes above 25,000 feet. Jets landing under conditions of low visibility require specialized short period advices, since their fuel consumption is very high at low altitudes.

On the basis of the House action, the number of sets of special equipment for observing bad weather at the end of the runway will be reduced from 46 to 16 sets.

Science News Letter, May 4, 1957

TECHNOLOGY

Film Processing in One Bath in Five Seconds

➤ A SINGLE SOLUTION for processing photographic film is on the way. Moreover, it will be ultra-rapid, less than five seconds, if films are made more sensitive.

This prospect was reported to the American Chemical Society meeting in Miami by Harry S. Keelan, research associate in Boston University's physical research laboratories.

The projected monobath would allow processing in a tenth the time and a third the space now required. Newsreels for transmission or television should be processed in 90 seconds in a single handling.

The basic problem in a monobath is a race between developer and fixer in the single bath. The developing activity must change as much of the exposed crystals as possible into silver before they are entirely removed by the fixer.

Science News Letter, May 4, 1957

GEOLOGY

Better Method Accounts For Water Gains, Losses

➤ AN IMPROVED METHOD of accounting for water gains and losses was developed in a pilot study of a small drainage basin at Salisbury, Md.

The method involves periodic determination of such factors as precipitation, streamflow, storage of water in the stream channels, ground-water level and soil moisture. It also involves mathematical analysis of factors not so easily measured, such as changes in the amount of ground-water storage and the amount of water evaporated from the soil or released to the air by vegetation.

Results of a test of the method, developed by the Geological Survey, were announced by Secretary of the Interior Fred A. Seaton. The drainage basin used was Beaverdam Creek near Salisbury, Md., which is about 20 square miles in area, but results are expected to be very useful in studies of larger drainage basins.

As a part of the mathematical analysis, a rating curve was devised that permitted an estimation of the amount contributed to a stream by seepage of ground water.

Science News Letter, May 4, 1957

IN SCIEN

TECHNOLOGY

Device Can Send 1,000 Words per Minute

➤ A DEVICE for transferring printed material automatically from one business office to another at the rate of about 1,000 words per minute has been experimentally developed by scientists at the Bell Telephone Laboratories.

Called the "data subset," the device can transmit and receive large amounts of data over telephone lines. It can be made self-checking to provide substantially error-free communication.

When perfected, the device, together with modified office equipment, is expected to provide inter-office accuracy and speed for accounting and bookkeeping procedures.

Science News Letter, May 4, 1957

MEDICINE

TB Drug Found Good for Arthritis, Mental Illness

➤ A DRUG DEVELOPED in 1952 to treat TB patients has turned out to be effective in treating psychotic and arthritic patients, scientists from the Rockland State Hospital, Orangeburg, N. Y., and the Cleveland Clinic, Ohio, reported to the American Psychiatric Association meeting in Syracuse, N. Y.

The new drug, trade named Marsilid and known chemically as iproniazid, was observed to produce euphoria in TB patients and was then tested on a group of withdrawn and depressed mental patients.

After five months of treatment with the drug, 12 out of 17 patients showed definite improvement, Dr. Nathan S. Kline, Rockland State Hospital, reported.

Two of the most impressive results were obtained with patients suffering from hebephrenic schizophrenia, a difficult-to-treat form of the disease that is marked by regression to an infantile level.

Marsilid was also tried on long-term arthritic patients by Dr. Arthur L. Scherbel, director of the department of rheumatic disease, Cleveland Clinic, because many of his patients developed varying degrees of depression, hostility and dependency due to their arthritis.

The changes in the joints were not dramatic, Dr. Scherbel said, but there was a partial relief of inflammation and definite improvement in more than two-thirds of the 30 patients.

The most consistent response was a gain in weight, he added.

Marsilid is produced by Hoffmann-La Roche, Inc., Nutley, N. J.

Science News Letter, May 4, 1957

CE FIELDS

BIOCHEMISTRY

Pain Reliever Is Faster Than Morphine

➤ A SYNTHETIC PAIN-KILLER that works in ten minutes has been developed, Dr. George de Stevens, a senior research chemist of CIBA Pharmaceutical Products, Inc., Summit, N. J., reported to the American Chemical Society meeting in Miami.

Among the fastest-acting pain-killers now known, the drug is currently undergoing tests for human therapy.

In animal tests, the new compound relieved pain in 10 minutes, as against 45 minutes required for morphine to act, Dr. de Stevens said. Like morphine, the synthetic belongs to the family known as analgesics, agents which ease pain without causing the patient to lose consciousness.

In experiments with rats and mice, the synthetic appeared free from a serious side-effect encountered with morphine, the tendency to slow down the rate of breathing. In comparison with another group of analgesics called the antipyrines, the new substance showed more activity and less toxicity.

Exactly how analgesics produce their results in the body is not now known, but many scientists believe that they have a blocking effect on the central nervous system. It is hoped, Dr. de Stevens explained, that the new synthetic will relieve pain in humans without causing uncomfortable side-effects.

The description of the new drug was co-authored by Dr. Jurg A. Schneider and Heino A. Luts of CIBA.

Science News Letter, May 4, 1957

MEDICINE

Cow Bone Used in Mouth Surgery

➤ COW BONE for repairing defects in human jaws is being studied at the Naval Medical Research Institute and the Naval Dental School, Washington.

A report on its success in monkey jaws is made by Capt. Fred Losee of the Institute and Cdr. Philip J. Boyne, Naval Dispensary, Washington, in the British scientific journal *Nature* (April 20).

The results indicate that the "anorganic" bone may have wide application to various types of mouth surgery in humans, Capt. Losee reports.

The bone is currently being tested in human jaw bones and the results so far have been as successful as those obtained in animals, he told SCIENCE SERVICE.

Probably the most vital use of the bone will be for civil defense emergencies when great quantities of bone will be needed immediately, he added.

The cow bone used for grafting was boiled with ethylenediamine to remove the proteins, starches, sugars and fats from the matrix of the bone. These are the substances believed to cause ill effects in cross-species grafting.

The treated bone is very white, easily shaped and extremely porous. It does not decay and can be sterilized by boiling or autoclaving.

When used in monkey jaws there was no evidence of foreign body reaction and new bone formation was found as early as 13 days after grafting, Capt. Losee reports.

Science News Letter, May 4, 1957

MEDICINE

Early Silicosis Spotted By X-Ray of Lymph Node

➤ A MORE ACCURATE WAY to diagnose the age-old occupational disease silicosis by X-ray diffraction was reported by John C. Soet and D. E. Van Farowe, Michigan Department of Health, Lansing, to the American Conference of Governmental Industrial Hygienists meeting in St. Louis.

The test is made by taking a small piece of tissue from a lymph node in the neck and exposing it to a stream of X-rays. If there are deposits of silica in the tissue, the X-rays will be scattered in a particular pattern.

The tissue sample needed for the test is obtained by surgical biopsy. The research was done with the cooperation of Dr. John E. Summers, Sunshine Tuberculosis Hospital, Grand Rapids, Mich.

Science News Letter, May 4, 1957

BIOLOGY

Vaccine Effective Against Leukemia in Mice

➤ THE FIRST successful vaccine to protect mice against leukemia was reported by Dr. Charlotte Friend of the Sloan-Kettering Institute, New York, to the American Association for Cancer Research meeting in Chicago.

The vaccine is 80% effective against a virus discovered a year ago by Dr. Friend. This virus is the only known one that consistently causes leukemia in mice, even when inoculated into adult animals.

The vaccine is prepared by mixing the leukemia virus with formalin, a solution of the antiseptic formaldehyde. The Salk vaccine against polio is produced this way.

A series of three injections of the vaccine, spaced a week apart, was given to mice which were infected with the virus at either one, two, three or four weeks after vaccination.

Approximately 80% of the vaccinated mice were protected against leukemia although they were not protected against other forms of cancer, Dr. Friend emphasized.

Science News Letter, May 4, 1957

ENTOMOLOGY

Pesticide Shows Promise in Many Areas

➤ A LONG LASTING pesticide that effectively fights the enemies of cotton, citrus fruit and cattle will be available to some farmers this year, the American Chemical Society meeting in Miami was told.

Called "Navadel," the new pesticide was described by Dr. William R. Diveley of the Hercules Powder Company, Wilmington, Del.

Dr. Diveley said that in addition to being useful for cotton, citrus and deciduous fruits, grapes, vegetables and ornamental plants, "Navadel" controls leaf-hoppers, thrips, leaf miners and a number of mites, including the citrus red mite. It destroys not only adult mites, he reported, but also the eggs.

Dr. Dively prepared his report in collaboration with Drs. A. H. Haubein, A. D. Lohr and P. B. Moseley of Hercules.

Science News Letter, May 4, 1957

ENDOCRINOLOGY

Increase Brain Hormone To Treat Mental Illness

➤ TREATING MENTAL patients by increasing the amount of serotonin, a body hormone, in their brains has shown encouraging results, Dr. D. W. Woolley of Rockefeller Institute for Medical Research, New York, reported to the National Academy of Sciences meeting in Washington.

The technique was used in tests on victims of schizophrenia, the most widespread of the mental disorders. They were given two drugs, one to increase the amount of serotonin throughout the entire body, and another one to counteract the hormone's bad side effects. The studies suggest that the drug combination "suppresses" schizophrenia, but more trials will be needed to ascertain this, Dr. Woolley emphasized.

Dr. Woolley and a co-worker, Dr. E. Shaw, first noticed in 1954, that an experimentally induced deficiency of serotonin in the brain could bring on psychotic-like reactions in humans. This suggested that the naturally occurring mental disorders, such as schizophrenia, might also be due to a lack of serotonin.

But raising the amount of serotonin in the brain turned out to be a difficult problem. Even though quantities of the hormone were introduced into the body, no detectable amount passed into the brain.

The drug combination which causes an increase in the brain's serotonin content alone, includes 5-hydroxytrytophane, a chemical used by the body to make serotonin, and BAS, a drug that counteracts the effects of increased body serotonin.

Side effects are quite severe, causing high blood pressure, diarrhea, and contraction of smooth muscle, Dr. Woolley reported.

Science News Letter, May 4, 1957

RADIO ASTRONOMY

Largest U. S. Radio Telescope

Financed by the National Science Foundation, this powerful radio telescope will assist U. S. scientists in their bid for leadership in the field of radio astronomy.

By ANN EWING

➤ THE NEWEST LISTENING POST in the United States to tune in on the radio waves being broadcast by the other planets and the sun as well as far-distant objects will soon be under construction in a remote mountain valley near Green Bank, W. Va.

With this 140-foot, dish-shaped antenna to catch radio radiation from vast regions of space beyond the power of present instruments, U. S. scientists will make a strong bid for leadership in the newest field of astronomical research, listening to radio broadcasts from the heavens. These celestial broadcasts are picked up on receivers much like those used for television, but 100,000 times more sensitive.

Although an American discovered 25 years ago that the sky is hissing at us, the British, Dutch and Australians have since out-distanced this country in studying these cosmic noises.

The receiving power of the 140-foot "saucer," as well as of other radio telescopes, may be increased 100 times through use of a new, low-temperature device now being developed. Known as the solid-state maser, the device would amplify the very faint signals received from space, allowing the radio telescope to "see" ten times farther than without it.

With or without this attachment, the giant antenna, financed by the National Science Foundation, will give scientists a powerful tool for examining the universe at radio wavelengths.

Strange Constellations

If eyes were sensitive to radio waves instead of to light, the heavens would appear strangely different. None of the familiar stars of the night sky would be observable. In their places would be many radio sources forming totally unfamiliar constellations.

About a dozen of these sources have been identified with faint objects seen telescopically, but many hundreds of the 2,000 now known have not. Even the objects detected both by radio and optical telescopes appear to have different sizes and shapes in each.

This is the broad picture over the entire celestial radio "window," which ranges from wavelengths of a few miles for low frequencies down to about an eighth of an inch for extremely high frequency microwaves, much wider than the range available using light alone.

Within this radio spectrum lies a particularly interesting region where the 140-foot antenna is expected to be tuned in extensively. This is at 1,420 megacycles, the frequency emitted by the unseen atoms of hydrogen in interstellar space.

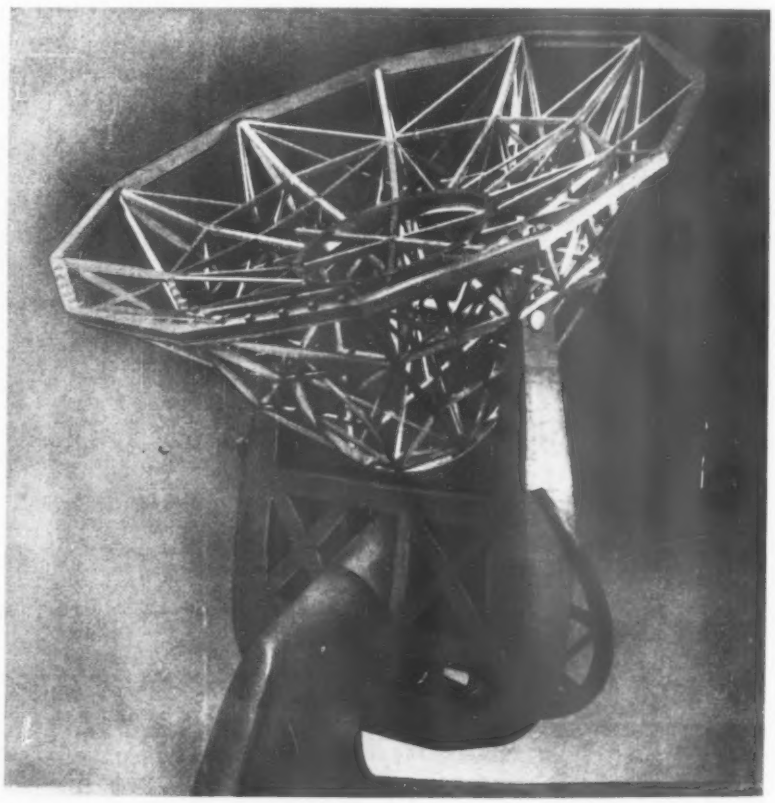
The hydrogen line broadcasts were discovered in the United States in 1951, and shortly thereafter confirmed by the Dutch and Australians. Although only this one line has so far been discovered, the Green Bank instrument is sure to look for three others at other frequencies: deuterium, or heavy hydrogen; the hydroxyl group, OH; and the carbon-hydrogen radical, CH.

Extensive surveys have shown the hydrogen radiating at 1,420 megacycles is concentrated within the spiral arms of our galaxy, and these arms have now been traced out in some detail. Tuning in on the eight-inch radio waves from hydrogen in the space between the stars opened up portions of the Milky Way closed to optical astronomers because of vast gas and dust clouds. The Milky Way is the great stellar pinwheel of billions of stars in which the sun and its planets, including the earth, are only an insignificant dot.

The hydrogen radiation has also been detected from other galaxies, giant clusters of billions of stars lying far beyond the Milky Way.

Since the 140-foot radio telescope can gather radiation from considerably farther away than can present instruments, it will be aimed at galaxies more distant than those so far found. The object would be to confirm the apparent expansion of the universe.

About as far as the giant 200-inch telescope atop Mt. Palomar in California can



MODEL OF 140-FOOT RADIO TELESCOPE—Developed by Prof. Ned L. Ashton of Iowa City, Iowa, the large yoke is mounted on the polar axis parallel to the earth's axis. At the upper ends of the yoke's arms is a declination axis on which the dish-shaped antenna is mounted.

reach, some two billion light years into space, the universe appears to be flying apart at a rate that increases directly with distance. This apparent expansion is detected and measured by the reddening of light from far-distant galaxies, the so-called red shift.

As in the case of sound and light waves, radio waves have a higher frequency when the source is approaching and a lower frequency when it is receding. By measuring the amount of this shift, the velocity of the radio source can be found.

Research Planned

Two distinct studies of the hydrogen line have confirmed the apparent expansion of the universe at distances of 75,000,000 and 100,000,000 light years. A light year is the distance light travels in one year at 186,000 miles per second.

Since the 200-inch can see some two billion light years, scientists would be more confident they are dealing with true expansion effects and not some change in fundamental laws with distance if the correspondence of both light and radio effects could be confirmed by radio waves from sources considerably beyond those now measured.

The structure of the Milky Way, the search for unseen elements between the stars and the apparent expansion of the universe are only a few of the many problems scientists hope to resolve using the Green Bank instrument. Although smaller than its 250-foot counterpart being constructed by the British at Jodrell Bank in England, it will have an exceptionally high precision.

Congress has appropriated approximately $4,000,000 for purchasing the land, constructing the telescope and building other necessary facilities. Associated Universities, Inc., New York, will manage activities at the installation since the National Science Foundation is forbidden by law from engaging directly in research.

Facilities for Teaching

Facilities of the national radio astronomy observatory at Green Bank will be available for research to radio astronomers from the entire country. The site was selected over 29 other locations because radio noise there is at a minimum, the high mountains acting as a shield against much of the undesirable radio noise.

The equipment at Green Bank will also be available for training graduate students in radio astronomy, the science in which astronomy and electronics are merged. Although this new science is 25 years old, its real significance as a tool for exploring the universe was not fully realized until after World War II.

The radio sky was first glimpsed in 1932 by Karl Jansky, an engineer at Bell Telephone Laboratories. In the last ten years, one discovery has followed another with bewildering speed. Larger and more sensitive receivers are being constructed in many countries, including the Soviet Union, to pick up the very faint radio signals from space.

The sun, a powerful emitter of radio waves, is being extensively studied, as are the three planets so far detected by radio, Jupiter, Venus and Mars.

The second brightest radio source in the sky was found, after close cooperation between optical and radio astronomers, to be a most unusual event — two very distant galaxies in collision. The stars in each galaxy are much too far apart to smash into each other but the gas between the stars is set into violent motion by the collision. Highly turbulent gas radiates radio waves.

If the colliding galaxies were ten times more distant, they could not presently be observed even with the 200-inch Palomar telescope. As a radio object, they could, however still be detected by sensitive radio telescopes.

With the new instruments now coming into operation, scientists may thus be able to "see" far beyond the limits of visible space as they probe ever outward in their search for knowledge and understanding of the universe.

Science News Letter, May 4, 1957

BIOCHEMISTRY

Antibiotic to Protect Plant Crops Is Isolated

➤ FARMERS MAY soon have a new antibiotic to fight a variety of crop diseases. Called Duramycin, it has been found effective against several diseases afflicting beans, wheat and bluegrass.

Duramycin, named because of its ability to withstand heat, was isolated by U. S. Department of Agriculture researchers, Dr. Odette L. Shotwell of the USDA Northern Utilization Research Branch, Peoria, Ill., reported to the American Chemical Society meeting in Miami.

The antibiotic is extracted from a culture of antibiotic materials produced by a variant form of the organism *Streptomyces cinnamomeus*, the source of another antibiotic, Cinnamycin.

Co-researchers with Dr. Shotwell were Dr. Frank H. Stodola and Robert G. Dworschack, chemists, and Lloyd A. Lindenfelser and Dr. Thomas G. Pridham, bacteriologists, all of the Northern Utilization Research Branch, and William R. Michael of St. Louis University, St. Louis, Mo.

Science News Letter, May 4, 1957

● RADIO

Saturday, May 11, 1957, 1:45-2:00 p.m., EDT.

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. F. W. King, director of service, Medical and Scientific Department, American Cancer Society, New York City, will discuss "The Fight Against Cancer."

• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ATOMIC ENERGY APPLICATIONS WITH REFERENCE TO UNDERDEVELOPED COUNTRIES: A Preliminary Survey—B. C. Netschert and S. H. Schurr—*Johns Hopkins Press* for Resources for the Future, 129 p., paper, $2.00. Reporting a study undertaken at the request of the Ford Foundation.

BEEKMANTOWN GROUP (LOWER ORDOVICIAN) OF MARYLAND—William J. Sando—*Geological Society of America*, Memoir 68, 161 p., illus., $5.00. Offering details on the stratigraphy, fauna and genesis of the Lower Ordovician beds and providing a detailed geologic map of the Great Valley of Maryland.

CANADIAN CANCER CONFERENCE: Volume 2, Proceedings of the Second Canadian Cancer Research Conference, Honey Harbour, Ontario, June 17-21, 1956—R. W. Begg, Ed.—*Academic*, 398 p., illus., $8.50. Contributors to this volume number 35 leaders in the field.

THE CONQUEST OF THE ANTARCTIC—Norman Kemp—*Philosophical Library*, 152 p., illus., $4.75. Discussing plans for mastering Antarctica during the International Geophysical Year.

ENGINEERING ENROLLMENT IN THE UNITED STATES—Norman N. Barish, Ed.—*New York University Press*, 226 p., charts, $7.50. A chapter on engineering education in the USSR is included, placing the growth of our engineering education in clearer perspective.

FLEAS, FLUKES & CUCKOOS: A Study of Bird Parasites—Miriam Rothschild and Theresa Clay—*Macmillan*, New Naturalist Series, 305 p., illus., $5.00. Birds have been well studied, but few scientists have given attention to the "zoological garden" that makes its home on the bird's body.

FOUNDATIONS OF RADIO — M. G. Scroggie — *Philosophical Library*, 6th ed., 349 p., illus., $10.00. On the basic theory and fundamental laws of electricity and radio written especially for the beginner. British in origin, an appendix gives the American equivalents of the British terms.

HELICOPTERS WORK LIKE THIS—Basil Arkell and John W. R. Taylor—*Roy*, 62 p., illus. with drawings by Frederick G. Cook, $2.50. A book for young people.

HERE IS THE FAR NORTH—Evelyn Stefansson—*Scribner's*, 154 p., illus., with photographs by the author and others, $3.50. A beautiful book by the wife of the famous explorer.

HIGH-SPEED FLIGHT—E. Ower and J. L. Nayler—*Philosophical Library*, 227 p., illus., $10.00. Discussing the technical and physiological problems involved in man's ever increasing flying speed.

HOW LIFE BEGAN—Irving Adler, with a preface by Linus Pauling—*John Day*, 128 p., illus. with drawings by Ruth Adler, $2.95. A book for young people telling them what distinguishes the living from the non-living and how life could have begun on this planet.

HUMAN DISEASE—A. E. Clark-Kennedy—*Penguin*, 267 p., paper, 85 cents. For the intelligent layman and intended to remove the common misconception that a disease is just a combination of clinical signs and symptoms with diagnosis a cut-and-dried affair.

INTRODUCTION TO ORGANIC CHEMISTRY—Louis F. Fieser and Mary Fieser—*Heath*, 316 p., illus., $7.00. Much more theory has been included in this new Fieser text and also a section on applications to research.

AN INTRODUCTION TO SEMICONDUCTORS—W. Crawford Dunlap Jr.—*Wiley*, 417 p., illus., $11.75. For practical engineers who want to work with semiconductors and for senior year or graduate students.

JETS, WAKES, AND CAVITIES—Garrett Birkhoff and E. H. Zarentonello—*Academic*, Applied Mathematics and Mechanics Series, 353 p., illus., $10.00. Reporting the most important findings of nearly 100 years of research in a complex field of applied mathematics.

A LAYMAN'S GUIDE TO PSYCHIATRY AND PSYCHOANALYSIS: An Extensively Revised and Updated Edition of the Same Author's "The Mind in Action"—Eric Berne—*Simon and Schuster*, 2d ed., 320 p., paper, $1.50. A non-technical description of the normal workings of the human mind followed by a survey of the field of psychoanalysis. Foreword by Dr. Brill.

MAGIC HOUSE OF NUMBERS—Irving Adler—*John Day*, 128 p., illus. with drawings by Ruth Adler, $2.95. A book for young people intended to make a game or a pleasure out of elementary mathematics.

NEUTRON TRANSPORT THEORY—B. Davison with J. B. Sykes—*Oxford University Press*, 450 p., $12.00. Giving a comprehensive and up-to-date account of all the principal mathematical methods used in this theory.

1001 QUESTIONS ANSWERED ABOUT THE SEASHORE—N. J. Berrill and Jacquelyn Berrill—*Dodd, Mead*, 305 p., illus., $5.00. Information for the hobbyist intrigued by the life along the water's edge.

OPTICS: The Science of Vision—Vasco Ronchi, translated from the Italian and revised by Edward Rosen—*New York University Press*, 360 p., illus., $10.00. The Italian author has undertaken to revise the whole science of optics, taking into account the functioning of the human eye and brain.

THE PENICILLIN MAN: The Story of Sir Alexander Fleming—John Rowland—*Roy*, 153 p., illus., $2.75. A biography for young readers.

PROTEINS: Seventeenth Annual Biology Colloquium, Friday and Saturday, April 6-7, 1956—Tsoo E. King, Ed.—*Oregon State College*, 88 p., illus., paper, $2.50. Report of a meeting conducted in a spirit of informal discussion.

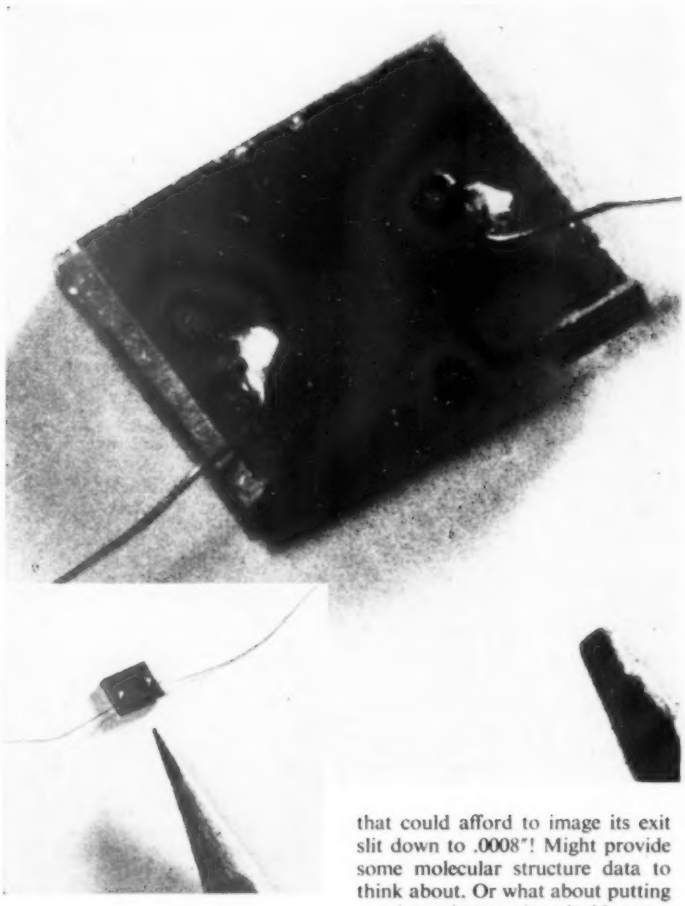
RUSSIAN-ENGLISH ATOMIC DICTIONARY—Eugene A. Carpovich—*Technical Dictionaries*, 317 p., $12.00. To help in reading or translating the new Russian scientific literature.

WHEN EGYPT RULED THE EAST—George Steindorff and Keith C. Seele, revised by Keith C. Seele—*University of Chicago Press*, 2d ed., 289 p., illus., $5.75. The 15 years since the first edition are only a brief moment in the history of Egypt, but they were filled with significant events.

YOUR CHILD OR MINE: The Brain-Injured Child and His Hope—O. E. Hood, preface by Tracy Jackson Putnam—*Harper*, 180 p., $3.00. The story, written for laymen, of how the author, a psychologist, started and operated a school for brain-injured children where a surprising number, considered hopeless by all physicians who had examined them, have been returned to their homes, public schools and even employment.

Kodak reports to laboratories on:

a photoresistor 20μ wide . . . trouping the colors in competition



Thin receptor

The thin black line is 20μ wide and 2 mm long. In the dark, d-c resistance across the .0008″ of lead sulfide is a few hundred ohms. When radiant energy shines on the line, the resistance drops. A manifestation, obviously, of the celebrated *Kodak Ektron Detector*. The wavelength of the energy can be from 3.5μ in the infrared,* right through the visible and on to at least 250mμ in the ultraviolet. Imagine an infrared spectrometer that could afford to image its exit slit down to .0008″! Might provide some molecular structure data to think about. Or what about putting one in an image plane inside some optical system?

For $23.50, paid to Eastman Kodak Company, Apparatus and Optical Division, Rochester 4, N. Y., anybody can have one. If the eloquence of these words gets us swamped, delivery may be a bit delayed. If you wanted to wait, it's not unlikely the price will drop. But then you might not be first on your block.

*That would make a receptor less than 6 wavelengths wide, wouldn't it?

The dye game

Under "people's capitalism," a social system with a brilliant future still in prospect, analytical chemistry often becomes a competitive weapon. We not only run a stand on the sidelines of the fray where we sell reagents and other *Eastman Organic Chemicals* useful in playing the game, but under a different hat we also play ourselves. It's a happy, invigorating game with many, many winners.

As player, one of our most interesting recent moves has been the launching of nine new dyes for polyester fabrics. They are as much definite chemical entities as 2-(p-di-methylaminostyryl)-1-ethylpyridinium iodide is a definite chemical entity. Such *Chemical Abstracts* nomenclature is quite proper in patents and the Eastman Organic Chemicals catalog, but under the rules by which gentlemen play, on dye-trade label, invoice, and promotional leaflet, names like *Eastman Polyester Yellow 5R* and *Eastman Polyester Navy G* designate the compounds evolved from our long experience in making dyes for synthetic fibers.

In the new group are dyes which excel most predecessors in the fastness they exhibit on polyester fibers despite various combinations of light, laundering, dry cleaning, and other paling influences. Some are new prototype structures from which new lines of descent may stem. Some are not so different from dyes previously successful on other hydrophobic fabrics. Some cost less to make (or develop) than others and are so priced.

Deciding which to use, how, in combination with which others - is another game. (When invited, we coach from dye service laboratories at Lodi, N.J., and Kingsport, Tenn.) Meanwhile, each band of analytical chemists silently reconnoiters the field, so intent they even forget at times who awards the points. It's that lady over there, clutching her purse.

Eastman Polyester Dyes *are sold by Eastman Chemical Products, Inc., Kingsport, Tenn. (Subsidiary of Eastman Kodak Company); exegetically labeled* Eastman Organic Chemicals, *by Distillation Products Industries, Rochester 3, N. Y. (Division of Eastman Kodak Company).*

Price quoted is subject to change without notice.

This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are... *serving laboratories everywhere*

Kodak

ASTRONOMY

Bright Comet Visible

➤ COMET AREND-ROLAND is now visible to the eye low in the northwest sky. It has a total brightness less than the faintest star in the Big Dipper. (See SNL, April 20, pp. 249 and 250, and April 6, p. 212.)

Although not as brilliant as originally predicted, it presents one of the most spectacular heavenly shows since Halley's comet in 1910.

Weather permitting, its tail can be seen stretching toward the northeast over an area equal to that covered by 50 full moons. It streams some 20,000,000 miles from the comet's head, about one-fifth of the distance from the earth to the sun.

Although its total naked-eye brightness is about magnitude four, the visibility of the head is much fainter. Shooting out from this nucleus in a direction nearly opposite from the tail is a slender jet caused by an eruption of gases from the comet's head. This jet is not curved by the sun's radiation pressure like the tail, but is a straight thin trail covering about the same area as eight full moons, or four degrees.

To see the comet, face northwest shortly after dark. Find the North Star (Polaris), then shift your eyes slightly to the left and directly down toward the horizon.

The first U. S. astronomer to spot Comet Arend-Roland after it receded from the sun's glare was Dr. George Van Biesbroeck of Yerkes Observatory, who used the 82-inch telescope at McDonald Observatory in Texas.

The celestial visitor is a "long period" comet. That is, unlike Halley's—expected to be visible again late in this century—it may not return to the solar system's vicinity for a thousand years or more. Its brilliance will fade, as it climbs toward Ursa Major.

The head of comets is believed to be a hard core of ice and dust, what some astronomers have called "a brilliant display caused by almost nothing." The comet's tail is a diffuse misty halo forced in a direction away from the sun by solar radiation. Most of its mass, which is not much, is loosely bound together in the nucleus.

The jets seen shooting from a comet's head are thought to be a surface explosion of organic material. The tail's light results from the action of sunlight on the fine particles boiled out of the comet's head as it passes close to the sun.

This comet was also spotted by the radio waves it broadcasts. Dr. John D. Kraus of Ohio State University found it by this technique for the first time.

The comet's heavenly position on May 7, as astronomers state it, will be approximately five hours, nine minutes in right ascension and 61 degrees, 51 minutes in declination.

Science News Letter, May 4, 1957

Questions

CHEMISTRY—What was Pliny testing for when he made the first colorimetric analysis? p. 275.

MEDICINE—How can doctors detect silicosis? p. 281.

PUBLIC HEALTH—What do scientists mean by the "doubling dose" when they speak of the dangers of radiation? p. 279.

RADIO ASTRONOMY—What organization will manage the new radio telescope at Green Bank, Va.? p. 283.

TECHNOLOGY—What is the highest temperature that glass fibers now being made can withstand? p. 277.

PHOTOGRAPHS: Cover, George A. Smith; p. 275, American Museum of Natural History; p. 277, British Information Services; p. 279, Ferranti Ltd., England; p. 282, Brookhaven National Laboratory; p. 288, Girdwood and Allen.

ENTOMOLOGY

Longhorn Beetle Is One Of Our Summer Insects

See Front Cover

➤ ABOUT one inch long, this cloaked longhorn beetle, shown on the cover of this week's SCIENCE NEWS LETTER, is easily recognized by its distinctive coloring. The front part of its wing covers is orange-yellow while the rest of its body, including its long knotty horns, is a bright blue color.

Among the more than 13,000 species in the family Cerambycidae this beetle is among the most beautiful. Its scientific name is *Desmocerus palliatus*.

Large numbers of this family of beetles are attracted in early summer by flowering shrubs. The cloaked longhorn beetle is also known as the elder bush beetle because its larva bores into the pith of the elder bush.

Science News Letter, May 4, 1957

PSYCHOLOGY

Forgetting Found Due To Lapse of Time

➤ FRESH EVIDENCE to support the theory that forgetting is due to the decay of memory with the passage of time is reported in the British scientific journal *Nature* (April 20) by Dr. R. Conrad of the Applied Psychology Research Unit, Medical Research Council, at Cambridge, England.

In Dr. Conrad's experiment, 30 subjects listened to numbers with eight digits recorded on tape at a rate of either 30 or 90 digits per minute. At the end of each series of digits, a timing device was started which clicked loudly at the same rate the digits had been given. Each subject was required to write down the number he had just heard, one digit at a time in step with the clicks.

Trebling the time lapse doubled the number of digits forgotten. When the subjects were allowed to repeat the digits at their own rate without the timer, the best memory score was obtained.

Science News Letter, May 4, 1957

CHEMISTRY

Find New Process for Making Anti-Knock Gas

➤ A COMPLETELY NEW process for making tetraethyl lead, the chemical anti-knock additive used in gasoline to raise its octane count, was presented at the American Chemical Society meeting in Miami.

The method, reported by S. M. Blitzer of the Ethyl Corporation, means that tetraethyl lead can now be synthesized from a wide range of organometallic compounds in combination with many common lead compounds.

"Probably the most significant discovery is that lead sulfide, lead oxide and lead dioxide react with organometallic compounds to form tetraethyl lead," Mr. Blitzer reported.

The research team responsible for the discovery included Mr. Blitzer, T. H. Pearson, D. R. Carley, T. W. McKay, R. L. Ray, L. L. Sims and J. R. Zietz of the Ethyl Corporation.

Science News Letter, May 4, 1957

Do You Know?

An ingenious device keeps *jet engines* from picking foreign objects off the ground by a downward directed jet of air which prevents the formation of the vortex responsible for sucking up materials.

Among the nation's 17,000,000 children under six, *accidents* cause more deaths than disease.

More students are preparing for *engineering careers* in 1957 than at any time since 1948.

New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 881. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

COMPASS and ELLIPSOGRAPH are combined in a two-in-one drawing and drafting instrument. The device will scribe circles up to 24 inches in diameter or produce ellipses up to 65 degrees and 12 inches radii. The beam compass converts to an ellipsograph with the change of points and addition of a third aluminum block.

Science News Letter, May 4, 1957

PORTABLE PLAYER is described as the first transistorized record player of its kind. A German import, the set measures 13 inches by 11 inches by 5 inches. Using four transistors, the record player operates on a six-volt battery and plays 33, 45 and 78 RPM records. Its frequency range is from 50 to 13,000 cycles per second.

Science News Letter, May 4, 1957

VINYL LATEX PAINT dries to produce a permanently bacteria-proof and fungus-proof wall surface, claim its developers. The non-toxic paint is said to prevent the growth of fungi as long as the surface is not covered up or insulated by extraneous deposits. The paint dries in 30 minutes and is washable in 24 hours. It can be used on plaster, concrete, metal and wood.

Science News Letter, May 4, 1957

PRECISION OILER, the size of a fountain pen, can lubricate any fitting. Made in Switzerland, it operates with any oil, including crude, and is designed to pick up all excess oil after application. Useful for oiling typewriters, as shown in the photograph, cameras, guns, lathes, precision machinery and electronic devices, the instrument functions at any angle, even upside down.

Science News Letter, May 4, 1957

EARTHENWARE LANTERN for dinner table or outside buffet has a tiny hole in the back to enable hanging on wall or fastening to exterior of house. The lantern comes with an insect-repelling citronella candle. It measures 9½ inches in height and 7 inches in diameter.

Science News Letter, May 4, 1957

FILM PROJECTOR, battery-operated, is said to produce up to 25,000 candle power with the use of a specially designed parabolic reflector. Operating on AC or DC, the projector can magnify a slide to the size of an entire wall in an average room. The projector is self-contained and can be carried and used anywhere.

Science News Letter, May 4, 1957

OXIDIZER FILTER is designed to prevent discolored laundry due to iron deposits in the water supply. The filter unit, which contains a replaceable element, can be installed in any ordinary public or private water supply system. It removes iron down to 0.1 part per million.

Science News Letter, May 4, 1957

ALUMINUM STAIR tread provides safer footing for industrial workers. The die-cast tread uses a slip-proof abrasive nosing. In tests, it has withstood loads in excess of 3,000 pounds. The tread is available in lengths from 24 inches to 42 inches and is a standard 10 inches wide.

Science News Letter, May 4, 1957

Nature Ramblings

By HORACE LOFTIN

Nature as a Hobby

➤ OPPORTUNITY KNOCKS all year round for the amateur naturalist, but it knocks loudest in the springtime.

Now the weather is balmy, the trees are in their new green and the mushrooms, flowers, frogs, bugs and birds are everywhere at hand. You cannot beat the springtime for beginning a nature hobby. Why not begin yours now?

You will find the selection of a "specialty"—frogs, beetles, minerals, birds, what-have-you—will greatly add to your pleasure in nature study. While you center down on your special subject, though, you will soon be amazed and pleased at how much you learn about other phases of nature. If you learn about the birds or insects in your area, you cannot help but learn about the special environments in which each kind lives, the plants and animals associated with them and a host of other related nature facts.

A noted amateur ornithologist, describing his first baptism into bird watching,

told how he bought his field glasses secretly and "shyly sneaked out the back door to look at birds." Well, that is typical. The first trip out with the new glasses, butterfly net or geologist's hammer, requires a certain strength of character—for some unknown reason. But honestly, nobody thinks you are cracking up; go ahead and jump in. Once in, you will only be sorry you stayed away from the fascinating game so long.

What are some nature hobbies for you? Of course, bird watching ranks high on any list. This requires a sizable investment in the form of binocular field glasses for any real satisfaction.

Why not start close to home, with the common insects of your own back yard? To range farther afield, you might try butterflies and moths, fascinating because of their various colors and forms. A collection of beetles is another full-time nature hobby and, incidentally, one in which Charles Darwin got his start as a naturalist.

In the plant kingdom, wild flowers are fun to collect, either dried and mounted or dug up and planted in your garden. The same goes for the ferns and mushrooms. And do not overlook the minerals.

Whatever special nature hobby you take up, you will find a good number of popular books to help. Have a good time.

Science News Letter, May 4, 1957